

MODEL **SW-717 Shortwave Receiver**

# **HEATHKIT<sup>®</sup>**

## **ASSEMBLY MANUAL**



PRICE \$2.00



Copyright © 1971  
Heath Company  
All rights reserved.

595-1293-04

Assembly and Operation  
of the



**SHORTWAVE RECEIVER**  
**MODEL SW-717**

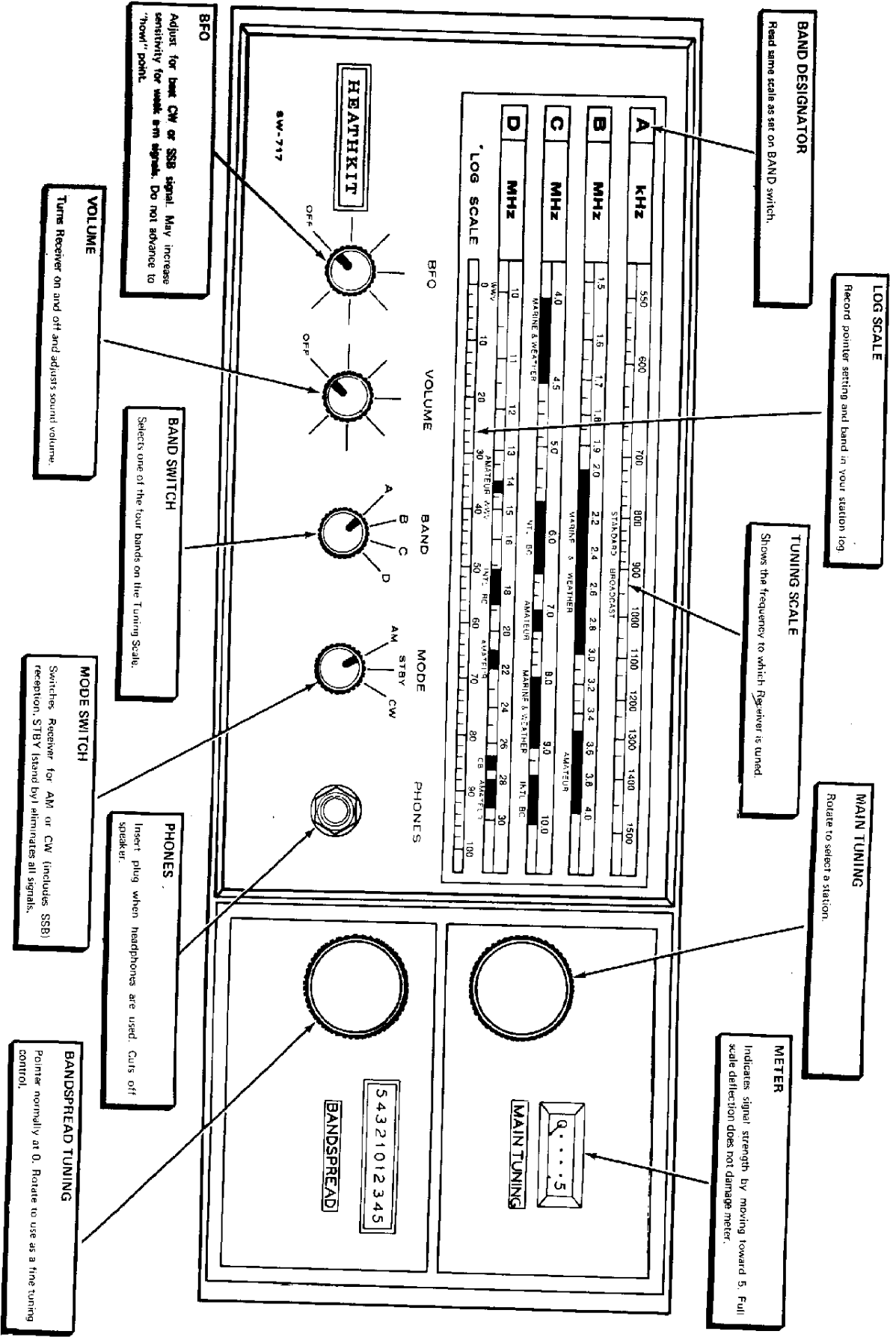
# INTRODUCTION

The Heathkit Model SW-717 Shortwave Receiver is designed to receive both the standard broadcast and the short wave bands. The receiver tunes from 550 kHz to 30 MHz in four overlapping bands.

The Receiver features electrical bandspread for all four bands, a relative signal strength meter, a BFO control, an automatic noise limiter, and a headphone jack. There is also a built-in rod antenna for the broadcast band and provisions for connecting an external antenna for shortwave reception.

Solid-state circuitry is used throughout. Most of the components are mounted on a printed circuit board both for ease of assembly and for reliability. The built-in power supply is transformer operated from either 120 Vac or 240 Vac and uses four silicon diodes in a full-wave bridge circuit.

*Refer to the "Kit Builders Guide" for complete information on unpacking, parts identification, tools, wiring, soldering, and step-by-step assembly procedures.*



**Figure 4**

# OPERATION

Before attempting to use the Receiver, carefully read the explanation of each control. Figure 4 (fold-out from Page 52) illustrates the front panel and describes the control functions. Figure 5 illustrates the rear panel.

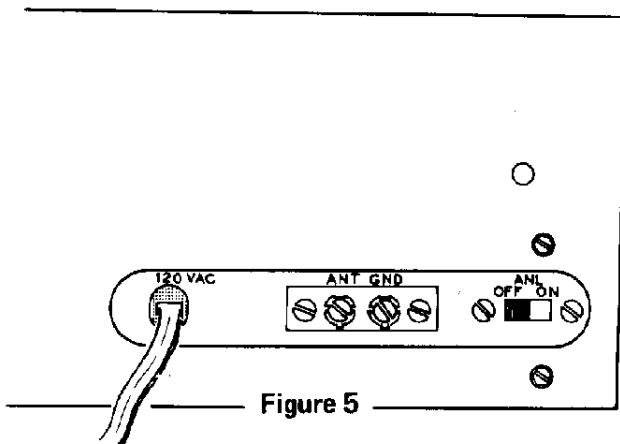


Figure 5

## CONTROLS

**VOLUME** - Turns the Receiver on or off and controls the sound from the speaker or headphones.

**BFO** - Required for the reception of CW or SSB (single sideband) signals. Turn the control clockwise until the signals are received as desired.

**MODE** - Selects AM, STBY, or CW (including SSB) modes of reception. In the AM position the AVC voltage is on; in the CW position the AVC voltage is off. In the STBY position the Receiver is kept warmed up and ready for instant use but it is kept muted.

**BAND** - Selects one of four bands: A, B, C, or D.

**MAIN TUNING** - Tunes the Receiver to the desired station.

**BANDSPREAD** - Provides fine tuning for the MAIN TUNING capacitor to help separate the incoming signals from each other when they are near the same frequency. This capacitor is normally left in the "0" position as its position affects the main dial calibration.

## AM OPERATION

The BFO control should be in the fully counterclockwise position. Turn the MODE switch to AM and advance the VOLUME control for sufficient volume. Set the BAND switch to the desired band and tune in a station with the MAIN TUNING control.

Turn the BANDSPREAD control until the desired station is clearest.

When listening to weak stations, slowly adjust the BFO control for the loudest and clearest reception.

## CW-SSB OPERATION

Turn the BFO control 3/4 turn clockwise. Turn the MODE switch to CW and set the BAND switch to one of the shortwave bands, B, C, or D.

With the MAIN TUNING control, tune in a CW station. Adjust the BFO control as follows: Turn the control fully clockwise and then slowly counterclockwise until the clearest tone is produced. The frequency of this tone may be varied either with the MAIN TUNING or the BANDSPREAD capacitor. Some experimentation will be necessary to find the best position for the BFO control.



When tuning SSB signals, tune to the SSB station and then alternate between the BANDSPREAD and BFO controls for the clearest reception.

**AUTOMATIC NOISE LIMITER (ANL)**

If you experience impulse type noise, such as automobile ignition radiations, move the (ANL) switch on the rear panel to ON.

**LOCATION**

If the Receiver is used on band A (which uses the built-in antenna) in a house which has aluminum siding, or in a steel

framed building, you may find the signals attenuated to some degree. Placing the Receiver near a window in the direction from which reception is desired may improve reception.

**TUNING SCALE**

A scale for each of the four bands appears on the front panel as shown in Figure 4. Each scale is calibrated in frequency. Scale A frequencies are in kilohertz (thousands of cycles per second). The other three scales are calibrated in megahertz (millions of cycles per second). A "log scale" is also provided for convenience in recording the pointer setting of stations for future reference.

**RECEPTION GUIDE**

| <u>BAND</u> | <u>FREQUENCY</u> | <u>TIME</u>                | <u>ZONE</u>                               |
|-------------|------------------|----------------------------|---|
| B           | 2.0 MHz          | All day                    | Marine and Weather                        |
| B           | 3.5 MHz          | All day                    | Local (Amateur)                           |
| C           | 6 MHz            | Evening                    | Latin America and Europe                  |
| C           | 7 MHz            | Evening                    | Europe                                    |
| C           | 7 MHz            | Late afternoon,<br>Evening | Europe                                    |
| C           | 7 MHz            | Morning                    | United States (Amateur)                   |
| C           | 9 MHz            | Morning                    | Asia and Australia                        |
| C           | 9 MHz            | Afternoon                  | Europe and Africa                         |
| C           | 9 MHz            | Evening                    | Europe and Latin America                  |
| D           | 11 MHz           | Morning                    | Asia and Australia                        |
| D           | 11 MHz           | Evening                    | Latin America                             |
| D           | 14 MHz           | Late morning,<br>Afternoon | United States, Foreign, (Amateur)         |
| D           | 15 MHz           | Late morning,<br>Afternoon | Europe and North America                  |
| D           | 15 MHz           | Evening                    | North and Latin America                   |
| D           | 17 MHz           | Afternoon                  | Europe                                    |
|             | 17 MHz           | All day                    | United States                             |
|             | 17 MHz           | Evening                    | South America                             |
| D           | 20 MHz           | Afternoon                  | Europe                                    |
|             | 20 MHz           | All day                    | United States                             |
|             | 20 MHz           | Evening                    | South America                             |
| D           | 27 MHz           | All day                    | Local (Citizen's Band)                    |
| D           | 28 MHz           | Morning                    | Europe                                    |
|             | 28 MHz           | All day                    | Central America, United States (Amateur), |
|             |                  | Evening                    | Asia                                      |

These reception conditions prevail in the spring and fall of the year. They are also subject to varying atmospheric conditions, sun spot activities, and to some extent, weather conditions. In the winter, reception generally will be best on the lower frequency bands. In summer, reception will be better on higher frequency bands.

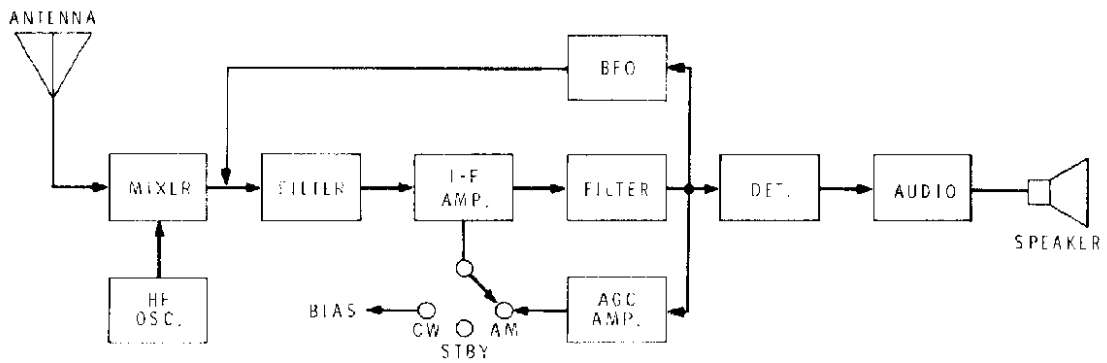
# SPECIFICATIONS

## Frequency Coverage:

|                                 |   |
|---------------------------------|---|
| Band A . . . . .                | 550 kHz to 1500 kHz.  |
| Band B . . . . .                | 1.5 MHz to 4 MHz.   |
| Band C . . . . .                | 4 MHz to 10 MHz.  |
| Band D . . . . .                | 10 MHz to 30 MHz.   |
| Meter . . . . .                 | Indicates relative signal strength.   |
| Headphone Jack . . . . .        | Low impedance headphones or an external speaker.  |
| Loudspeaker . . . . .           | Built in.   |
| Controls . . . . .              | VOLUME, with on-off switch.<br>MODE (a-m, Standby and CW).<br>BFO.<br>MAIN TUNING.<br>BANDSPREAD TUNING.<br>ANL (on-off).   |
| Transistor Complement . . . . . | 40673: mixer and rf amplifier.<br>2N3393: audio preamplifier.<br>2N5232A: i-f amplifier, agc amplifier.<br>2N5308: i-f amplifier.<br>MPF 105: oscillator.<br>MPSU05: final audio amplifier.<br>MPSU55: final audio amplifier.<br>X29A829: audio driver. |
| Power Supply . . . . .          | Transformer operated. Full-wave bridge rectifier.   |
| Voltage Requirements . . . . .  | 120 Vac or 240 Vac, 50/60 Hz.   |

- Power Requirements . . . . . 8 Watts.
- Dimensions . . . . . 14-1/2" wide, 5-3/4" high, 10" deep.
- Weight . . . . . 7 lbs.

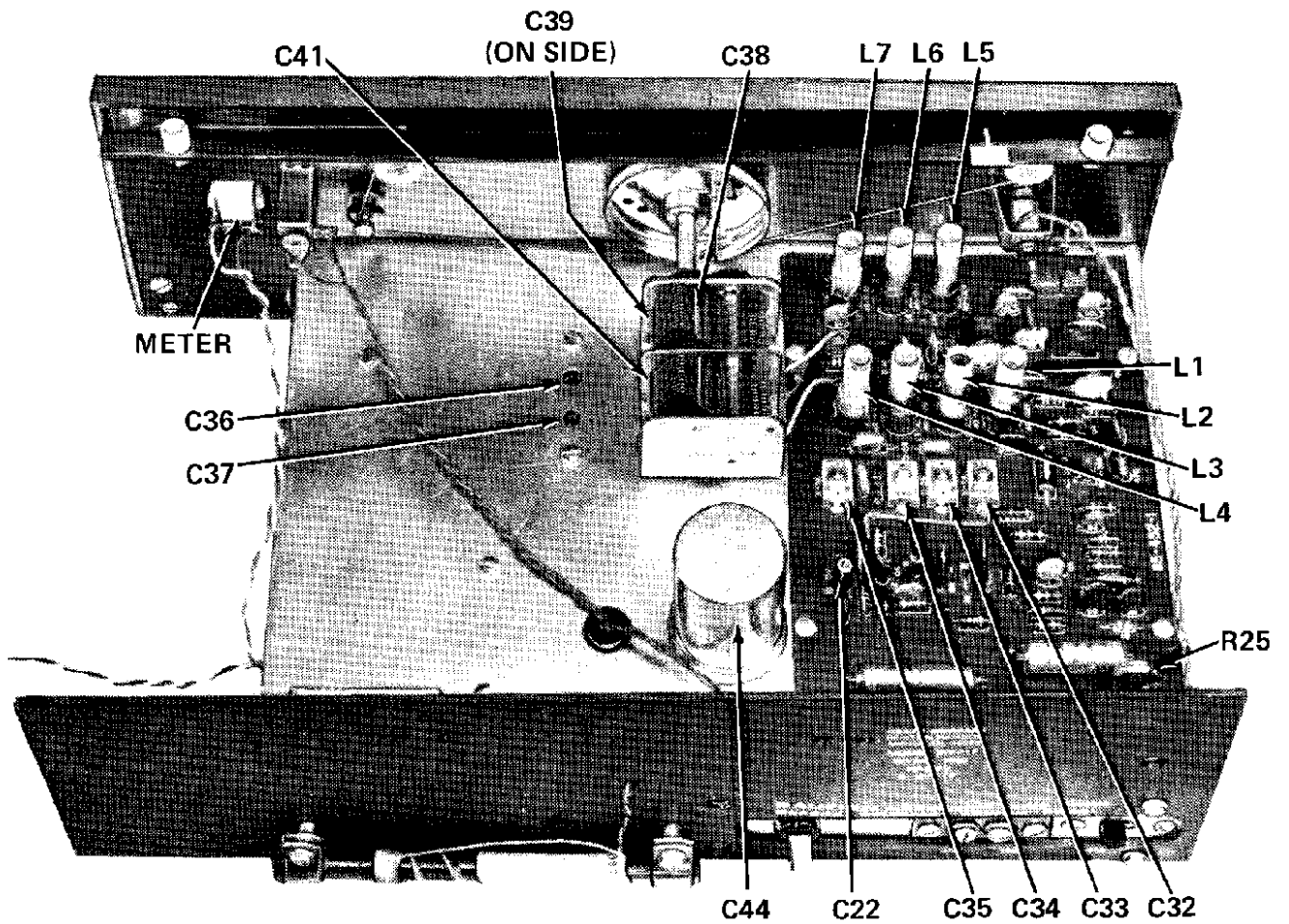
The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.

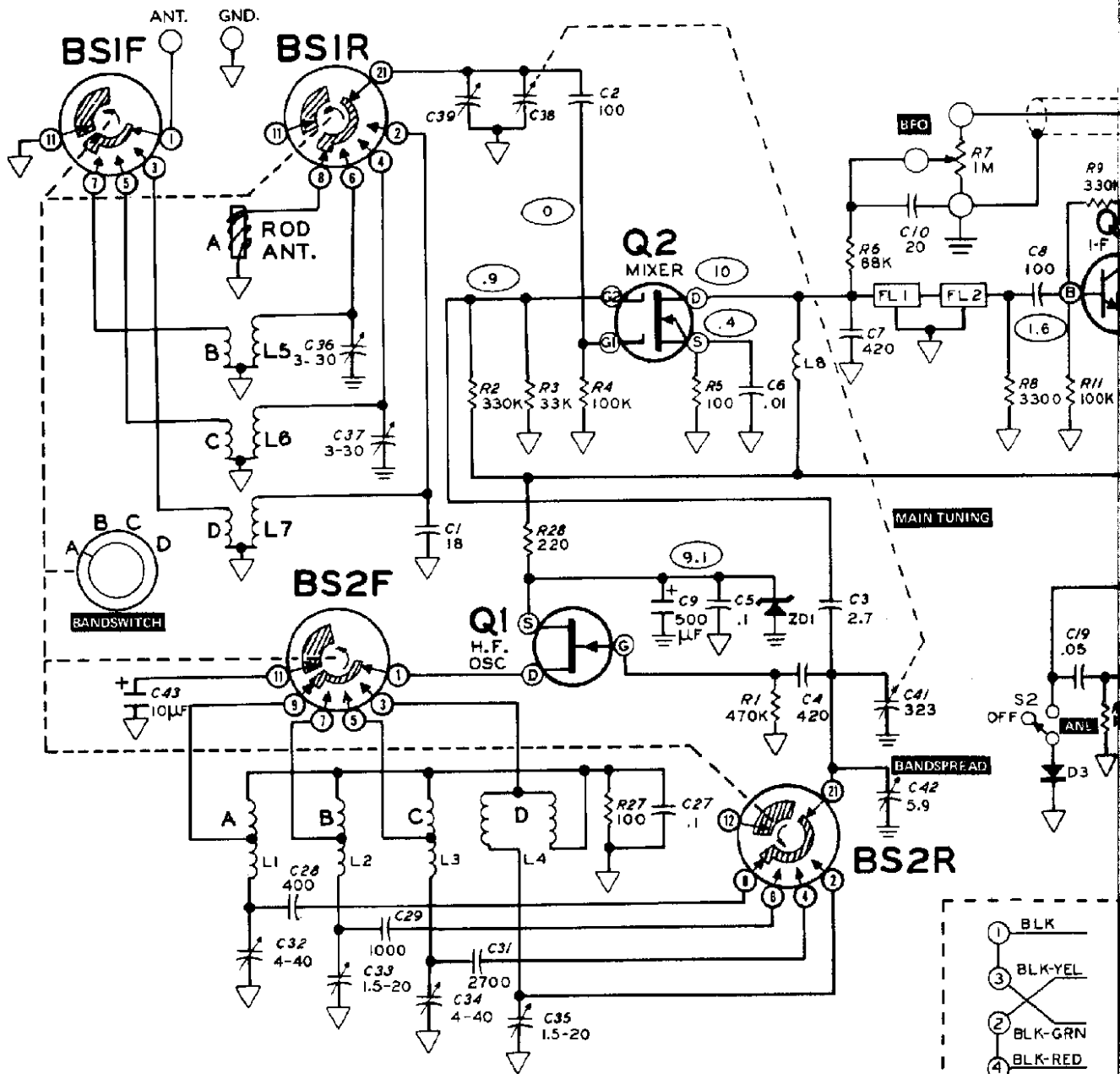


### BLOCK DIAGRAM



# CHASSIS PHOTOGRAPHS

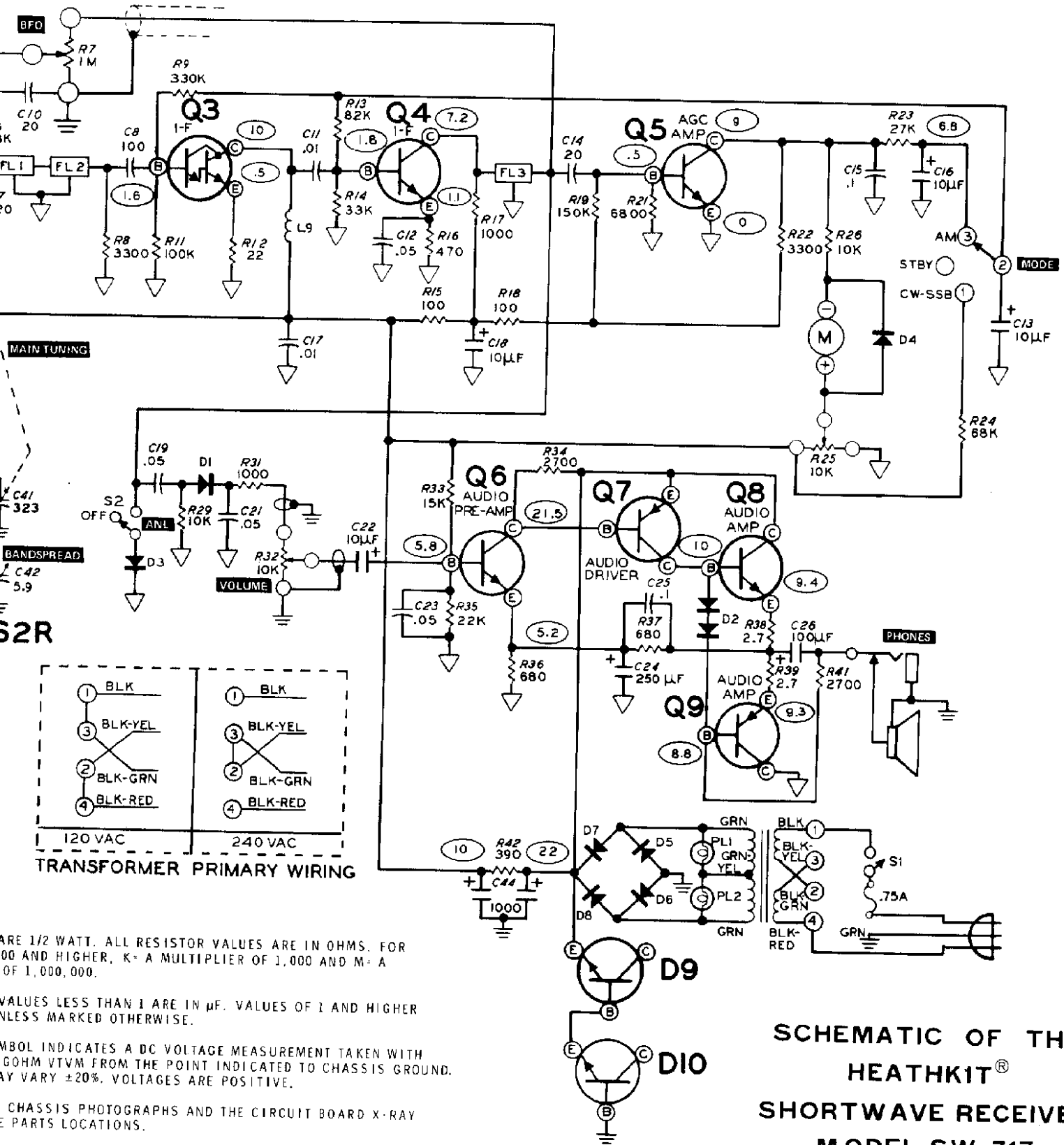




| PART NO.                                | COMPONENT                         | TYPE NUMBER                            | BOTTOM VIEW |
|---|-----------------------------------|--|-------------|
| 417-169                                 | Q1                                | MPF 105                                |             |
| 417-240                                 | Q2                                | 40673                                  |             |
| 417-222<br>417-91<br>417-118<br>417-201 | Q3<br>Q4, Q5<br>Q6, D9, D10<br>Q7 | 2N5308<br>2N5232A<br>2N3393<br>X29A829 |             |
| 417-224<br>417-225                      | Q8<br>Q9                          | MPSU05<br>MPSU55                       |             |
| 56-26                                   | D1, D3, D4                        | 1N191                                  |             |
| 56-61                                   | D2                                | STB-620                                |             |
| 57-65                                   | D5, D6, D7, D8                    | 1N4002                                 |             |
| 56-19                                   | ZD1                               | ZENER, 9.1V,<br>25MA, 1W               |             |

NOTES:

- RESISTORS ARE 1/2 WATT. ALL RESISTOR VALUES 10,000 AND HIGHER, K- A MULTIPLIER OF 1,000,000.
- CAPACITOR VALUES LESS THAN 1 ARE IN PF UNLESS MARKED OTHERWISE.
- THIS SYMBOL INDICATES A DC VOLTAGE OR AN 11 MEGOHM VTVM FROM THE POINTS VOLTAGES MAY VARY ±20%.
- REFER TO THE CHASSIS PHOTOGRAPHS FOR PARTS LOCATIONS.
- BANDSWITCH WAFERS ARE VIEWED FROM THE FRONT. THE ARROW SHOWS THE PIN CONNECTS THE OPPOSITE SIDES OF THE WAFER.
- CONNECTIONS FOR THE POWER TRANSFORMER ARE IN THE BOXED INSET DRAWING.



**SCHEMATIC OF THE  
HEATHKIT®  
SHORTWAVE RECEIVER  
MODEL SW-717**

ARE 1/2 WATT. ALL RESISTOR VALUES ARE IN OHMS. FOR  
00 AND HIGHER, K- A MULTIPLIER OF 1,000 AND M- A  
OF 1,000,000.

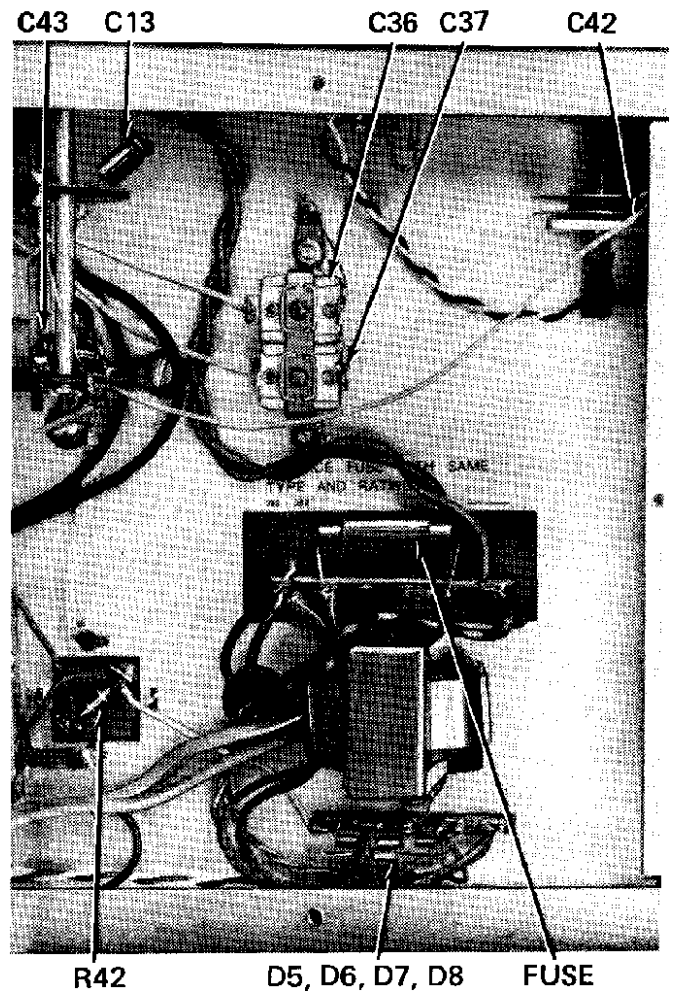
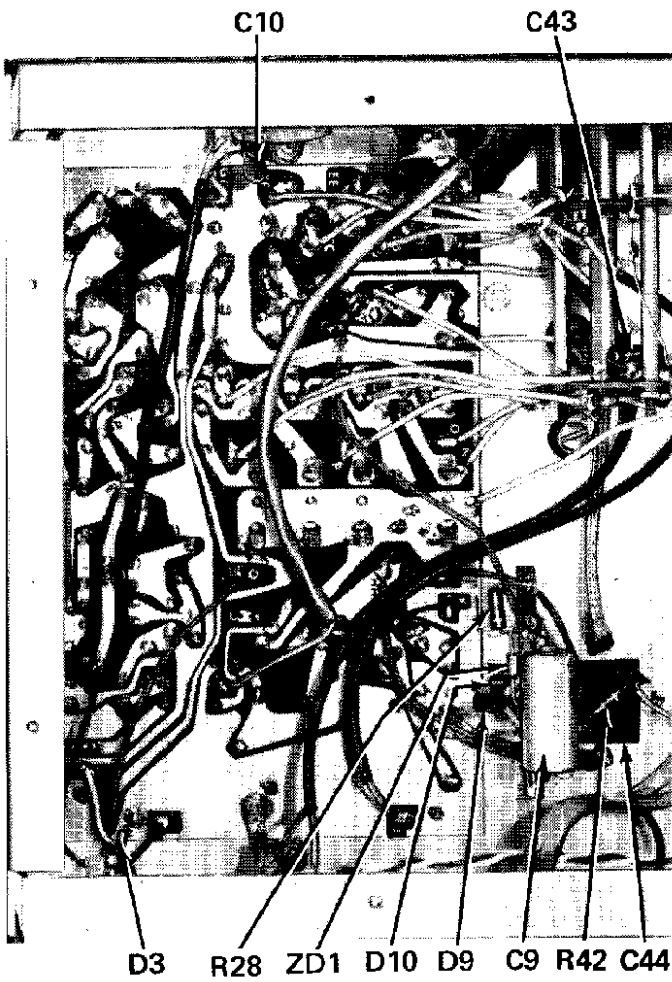
VALUES LESS THAN 1 ARE IN  $\mu$ F. VALUES OF 1 AND HIGHER  
UNLESS MARKED OTHERWISE.

SYMBOL INDICATES A DC VOLTAGE MEASUREMENT TAKEN WITH  
50 OHM VTVM FROM THE POINT INDICATED TO CHASSIS GROUND.  
VALUES VARY  $\pm 20\%$ . VOLTAGES ARE POSITIVE.

CHASSIS PHOTOGRAPHS AND THE CIRCUIT BOARD X-RAY  
PARTS LOCATIONS.

WAFERS ARE VIEWED FROM THE REAR. SWITCH CONTACTS  
A. THE ARROW SHOWS THE DIRECTION OF ROTATION. A TIE  
S THE OPPOSITE SIDES OF THE ROTOR OF WAFER #1.

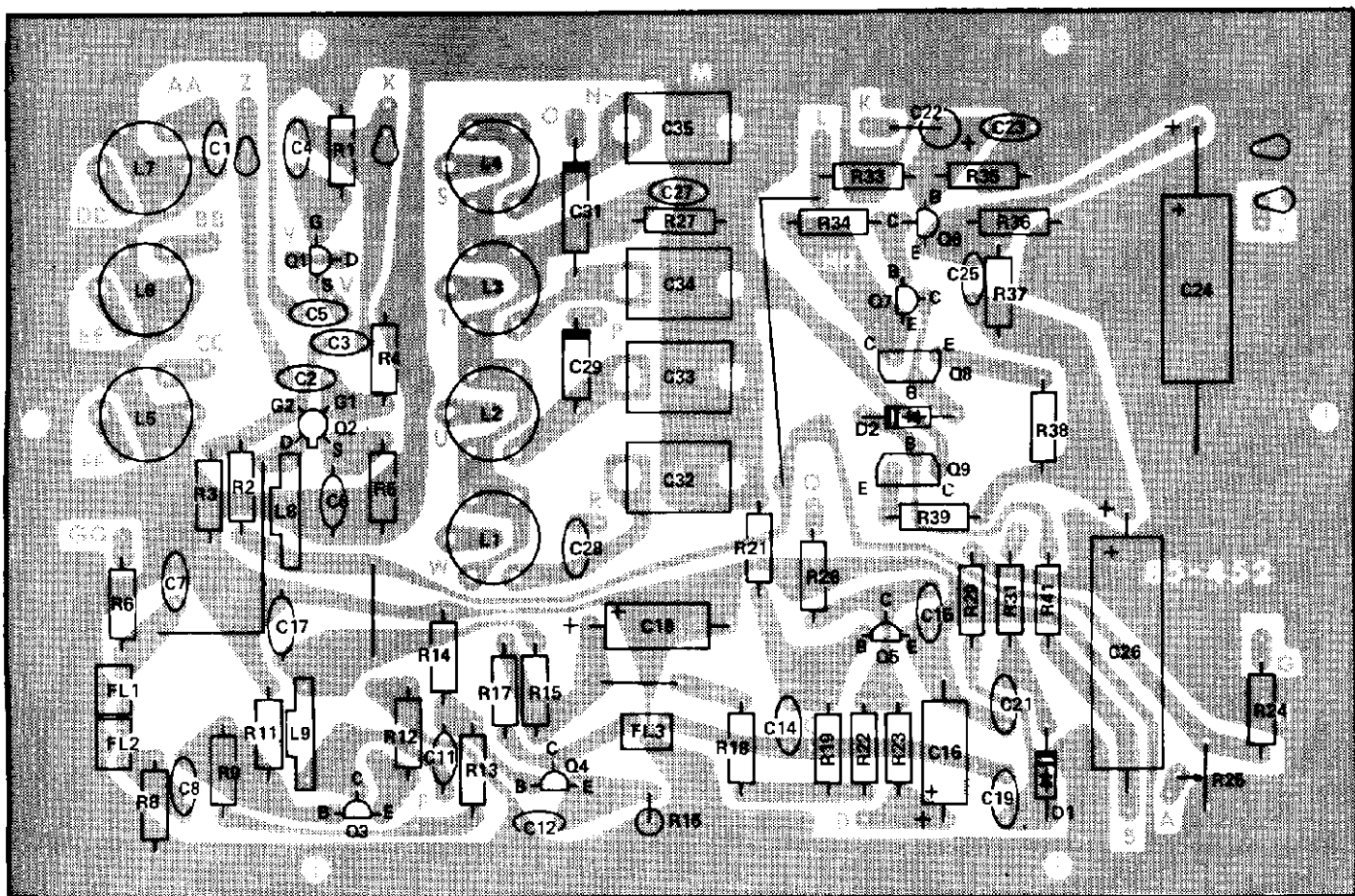
FOR THE POWER TRANSFORMER PRIMARY WIRES ARE SHOWN  
INSET DRAWING.



# CIRCUIT BOARD X-RAY VIEW

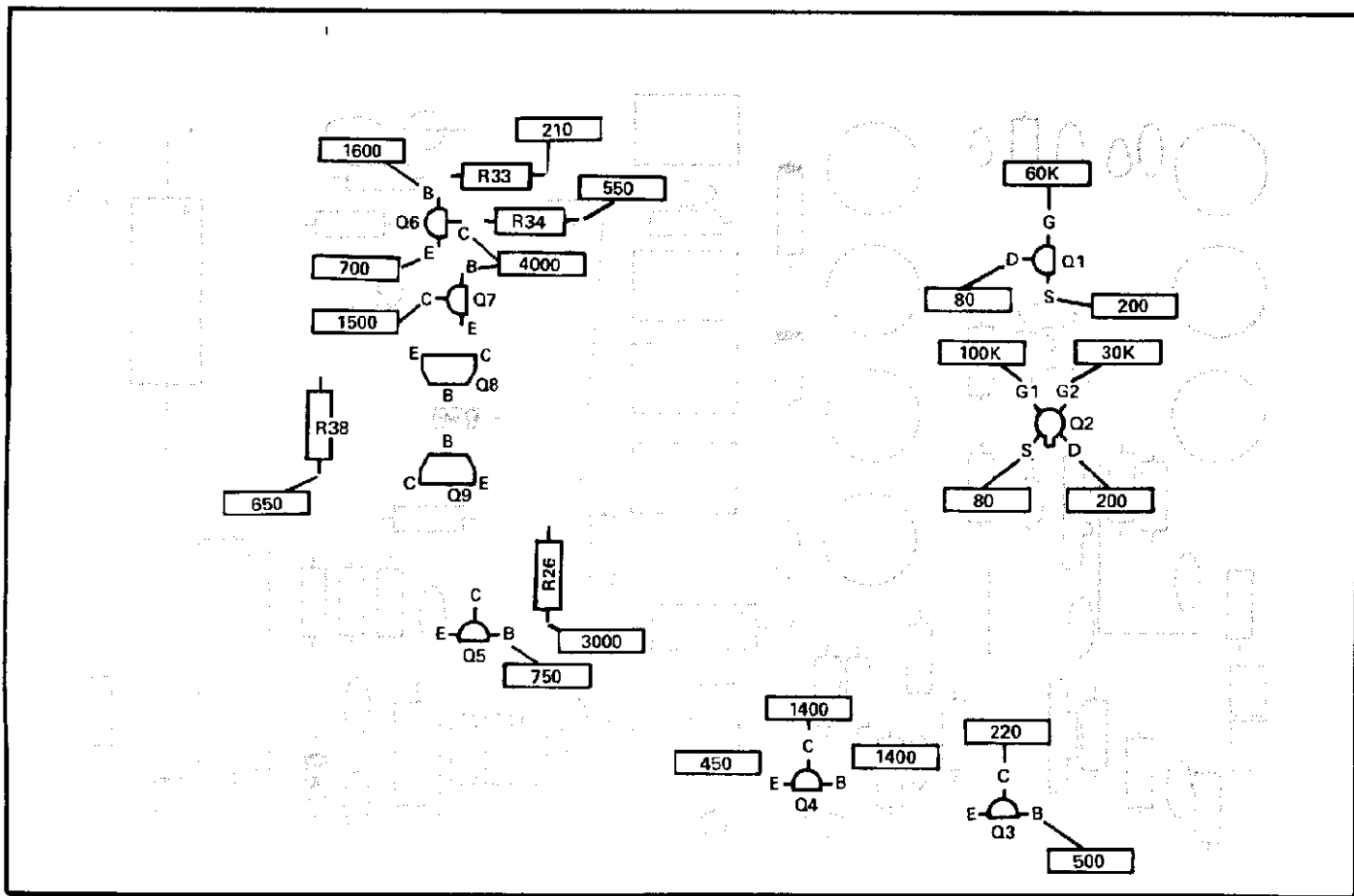
NOTE: To determine the value of one of these parts, proceed as follows:

1. Note the identification number of the part (R-number, C-number, etc.).
2. Locate the same identification number (next to the part) on the Schematic. The "Description" of the part (for example: 22 k $\Omega$ , .05  $\mu$ F) will also appear near the part.



(SHOWN FROM FOIL SIDE)

# RESISTANCE CHART

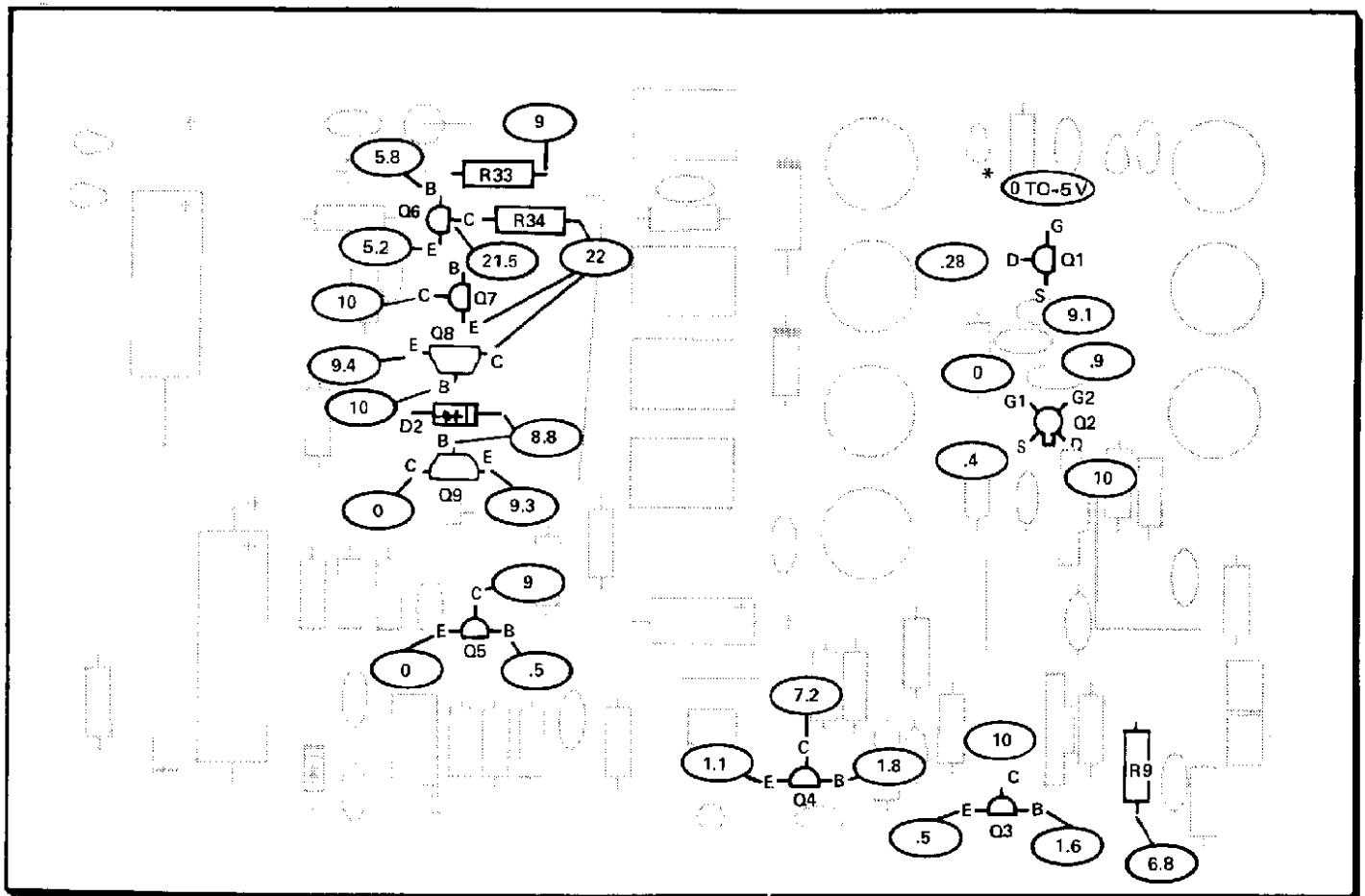


(SHOWN FROM COMPONENT SIDE)

ALL RESISTANCES ARE IN OHMS (K=1000)

| CONTROL POSITIONS |     |
|-------------------|-----|
| VOLUME            | OFF |
| BAND              | ANY |
| MODE              | ANY |
| BFO               | ANY |

# VOLTAGE CHART



(SHOWN FROM COMPONENT SIDE)

**SWITCHES**

OFF-VOL-ON: 11 O'CLOCK

BAND-A

AM-STBY-SSB:AM

BFO: OFF

TUNE TO A SPOT  
WITH NO STATION

\* VOLTAGE DEPENDS ON BAND  
AND DIAL POSITION

Voltages measured to chassis with  
a voltmeter having an 11 megohm  
input impedance. Voltages may vary 20%.